A Study of Online Presence in Digital Learning Environments

Research-in-Progress

Jongbok Byun
Ashford University
jongbok.byun@ashford.edu

Jorge Cardenas
Ashford University
jorge.cardenas@ashford.edu

ABSTRACT

Online courses are popular in the United States. In particular, the Massive Open Online Courses (MOOCs) platform such as Coursera and edX are used to deliver online courses exclusively. Although these courses often do not provide any college level credits or degrees, scores of people have already joined the courses and finished them. Many schools are struggling to incorporate online modalities into their curricula. Often they do not have enough resources to develop and deliver the online courses. In addition, delivered online courses are not as promising as expected, not just because the resources are lacking, but because they have different modalities from traditional classroom based courses. In this study, we propose a model of relationship between online presence and student learning outcomes. By identifying the proper measures of online presence, instructors can not only pass on their knowledge, but also drastically improve the learning experience for their students.

Keywords (Required)

Online Learning, Student’s Presence, Learning Analytics

INTRODUCTION

Online education has many advantages over the traditional classroom learning modality. Accessibility and affordability are the two main advantages (Lewis & Chen, 2010). Students do not need to physically go to a classroom to listen to a lecture at a given class time. Course materials are posted in the online classroom and can be accessed at any time. Without time and location restrictions, online education is much easier to access. It is also much more affordable than traditional education. Online education doesn’t need to maintain facilities such as classrooms and campus offices. In addition to this, online classrooms are easy to reproduce. Once the master template has been developed, the other classes can be copied from this template without any additional investments. With one third of the cost of traditional education, online education is much more affordable to a broader range of students (Damast, 2011; Morgan, 2000).

One clear difference between online and traditional courses is the level of interpersonal connection. Students and teachers are quite disconnected in online classrooms. Recorded lectures, discussion boards, and linked study resources are common features of many online course modalities, but they culminate in asynchronous course management systems. Students and teachers must communicate at different times and from different locations. Information technology enabled students to participate in online courses but the current information technology simply does not live up to traditional classroom based educational models.

Two of the biggest challenges in online education are educational effectiveness and learning quality. Although we can trace back the history of online education to the 60s (Harasim, 2000; Moore et al., 2011), many don’t think it is very creditable and has high quality (Rovai, 2002). One of the critical differences between online learning and traditional learning is face-to-face interaction. Since teaching and learning online are often asynchronous, online learning has less face-to-face interactions. Learning occurs when students and instructors interact in the classroom environment (Shea et al., 2010). Although information technologies make better online classroom experience, still there are many questions to answer regarding to the educational quality.

Most online classrooms are asynchronous which students and instructor are not presenting at the same time. Instead the online learners are looking for replies to their own postings when they logged into the classroom. Online presence is defined
as the feeling of being present in an online classroom. Students feel online presence when they join discussions, exchange emails with peers and instructors, and see the activities of others in the online classroom. Discussion threads are the current tools used to argue and go over ideas with others (Calvani et al., 2010). When the intervals between responses become too long, conversations become disconnected and students often lose interest in the course. They feel lonely and lost what to do to solve problems and write papers. Online presence conveys many cues to create a learning community and provides opportunities for active learning environment.

As online learning becomes more prevalent, we need to be able to understand student learning in a digital context and build appropriate teaching systems. With the current technology, it is possible to simulate a relatively realistic classroom setting by implementing virtual reality, augmented learning, and multimedia. However, these new technical products are pointless unless we know whether or not they improve student learning. To understand the relationships, we need to understand the different presence in online learning platform.

In this study, we claim that there exist different patterns in online presence of digital learning modalities and investigate the relationship between these online presence patterns and the student’s learning outcomes.

LITERATURE REVIEW

Presence can be defined in many different ways. Argyle and Dean (1965) defined presence as intimacy, which is influenced by physical distance, eye contact, smiling, and personal topics in conversation. Wiener and others defined the presence as emotional closeness between participants (Wiener et al., 1968). Later, Argyle and Wiener conceptualized intimacy and immediacy as the indicators of presence. Immediacy is how fast you can get responses (Short et al., 1976).

According to Gunawardena and Zittle (1997), online presence is the degree to which a person is perceived as ‘real’ in mediated communication. In other words, the perceived realness of the other participants is an indicator of their presence. The projection of one’s personality (Garrison, 2000), the sense of being together (Biocca et al., 2003), and the degree to which a person is perceived as a real person in mediated communication (Gunawardena, 1995) are the main concepts of online presence. Students should be able to project themselves socially and emotionally as ‘real’ people through the available media (Garrison, 2000).

The medium used to communicate determines the richness of shared information (Daft & Lengel, 1986). Face-to-face communication has the highest richness and numeric communication has the lowest richness. Computer Mediated Communication (CMC) has been considered a more inferior medium to communicate rich contexts than face-to-face communication. However, with enough time consumed together, CMC also can be a very personal communication media (Walther, 1996). Therefore, the presence can be a variable of the characteristics of communication medium. In this point of view, online education may have less capability to provide presence compare to the traditional educational system.

One method of measuring presence is to implement a survey. Student’s perception of others existence is the key to measuring presence (Lombard & Ditton, 1997). Tu claimed that presence to be measured with presence questionnaires. The questionnaire asks for user's perception, media attributes, engagement, privacy, and other components that might impact presence (Tu, 2002). Researchers and school administrators conduct end-of-class surveys asking for the students’ overall satisfaction, evaluation of the instructor, thoughts on the course materials used, and other relevant topics. Typical questions are “what do you feel about the classroom?” and “how do you feel about the course materials?”

Survey questions most likely do a moderate job in capturing student perceptions of presence. Students can provide feedback for whether they felt the presence of others or not, and whether their presence improved the educational experience. However, it is not a simple task to find what specific factors created those online learning or educational experiences. Without additional analysis, the survey results have limited usefulness for improving online learning environments.

The relationship between online presence and student performance is also difficult to uncover. It was discovered that ultimately, online presence impacts student satisfaction and learning outcomes (Rouker et al., 2001; Tu, 2002; Shea et al., 2010). Without presence, students tend to create psychological distance between themselves and other participants and the experience becomes task-oriented and depersonalized (Rutter, 1984). Task oriented or depersonalized experience will reduce the academic performance of students.
There are few arguments about what the presence is and how to measure it. However, there is no way to measure the presence in real time and plan for proper reactions. Especially, we don’t know which presence works how. Therefore, it is difficult to design the presence based educational format in online education.

**RESEARCH QUESTIONS**

This study focuses on two research questions. First, we would like to examine existing online presence patterns. Not every student has the same presence pattern. For example, some students start to participate as early as they can. They post their ideas and questions on the discussion boards early and they are more active to add comments to their peers and to the instructor. Because these students participate early, they have more chances to get feedback from their peers and especially from their instructor. Often they have time to reread their postings and correct them.

Compare to these early participants, some students participate late or even don’t participate well. These students normally post their discussions late. Also, the posting itself only meet the minimal requirements of the course. These late participants don’t have enough time to get the proper feedback from their peers and the instructor. Their postings often have poor quality and short in lengths. Probably many students are in the middle of these two extremes and have mixed participation patterns. Sometimes they are early and sometimes they are late to participate. We believe there are different patterns in online presence in students.

Question 1: Are there any presence patterns of students in online learning environment?

Online students are required to participate in the online classrooms each week. They should post their discussion threads to the online learning management system and need to submit their assignments on time. We hypothesized there are different online presence patterns and each pattern will have different impacts on student’s learning outcomes. Based on our experience as online educators, we identified the following four patterns of the online presence:

- **Early engager:** the students who engages in the online discussions in the classroom earlier than others. They are active participants in the discussion postings and questioning.
- **Follower:** the students who follow other students. They respond to others on time but they usually don’t lead the discussions or make any serious questions in the online classroom.
- **Lagged participants:** the students who usually late in their responses and homework assignments. They don’t lead the discussion nor make any significant contribution to the classroom. They frequently make excuses for their late works.
- **Minimal participants:** the students who participate in the online classrooms at the minimum level. They don’t respond to their instructor and peers. Often they do not complete their assignments and required discussion postings.

The next question is about the relationship between the online presence patterns and student’s learning outcomes. Each presence pattern might have different impacts on student’s learning experience. Eventually, these differences will lead different learning outcomes or performance. Active participation might have positive impacts on student performance.

Question 2: Students participation pattern is connected to the student’s performance.

**RESEARCH DESIGN**

Online classroom produces rich data sets which can be accessible by researchers and instructional designers for improvement of classes. In this study, we selected a sample online course to extract the activity data of students. We also extracted the grade information.
A typical 3-unit online class has 5 weeks of class period. Students need to post their discussions on the discussion board. Each week, two discussion questions are given to students to discuss. Specific due date (Thursday) is specified for each discussion posting and assignments (Monday). Students need to post their initial thought of the discussion topic by Thursday and need to reply at least two peers. Some weeks there could be additional assignments such as written papers, problem solving worksheets, and quizzes. A final paper is due by the end of the 5th week of the class. The class starts every Tuesday.

The following is a typical user interface to retrieve student’s activities in the classroom. We can observe each student’s presence minutes in the

We extracted attendance data from the Figure 2 and put the data into MS Excel to analyze. To find student’s presence pattern, we normalized personal differences in the online presence. For example, a typical student might have some variations of his/her presence due to some factors such as personal situations or some other unknown reasons. These factors are not directly related to the course contents and characteristics. To minimize the effects of these unpredictable factors, we averaged the attendance data.
Using the average of the student’s activity data, we summarized a course data which has 50 students in the period of October 23, 2012 to November 26, 2012. The course is an entry level English course in an online university. The university uses a learning management system which is called e-college as its main platform to deliver its online classes. The course is 5 weeks long and there are 2 discussion questions with 1 written assignment in each week. We selected this course as a sample course since this course has the most student population. Some other online courses have less than 10 students which makes the analysis difficult.

DATA ANALYSIS

We used Mathematica to find clusters in the data set. The uploaded data was analyzed by clustering function in Mathematica. With given 4 different possible clusters, the program produced the following clusters.
Each cluster shows similar presence pattern. Although we need to analyze these patterns and its implications further, only cluster 4 has more than 50 minutes daily presence in online classrooms. Other clusters don’t have such consistent patterns of participation through the five-week course.

Our second proposition was the presence patterns have impacts on student’s learning performance. To verify this proposition, we analyzed the relationships between each cluster and their class grades.

<table>
<thead>
<tr>
<th>DF</th>
<th>SumOfSq</th>
<th>MeanSq</th>
<th>FRatio</th>
<th>FValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>3</td>
<td>0.207828</td>
<td>0.69276</td>
<td>1.63841</td>
</tr>
<tr>
<td>Error</td>
<td>46</td>
<td>1.94499</td>
<td>0.0422824</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>2.15282</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. ANOVA Analysis Result

According to this result, there are no significant differences between clusters in terms of student’s academic achievements since the P-Value is 0.1935 at 0.05 confidence level.

CONCLUSION

We identified different presence patterns in online classrooms by using a cluster analysis. What we found is that each student has a different participation pattern and each pattern may be linked to student performance. Although we did not find strong evidence of a relationship between presence pattern and academic achievement, this study provides some ideas for developing future analyses.

In our following studies, we will include more data sets from online courses and analyze different presence patterns. This will improve research validity because a larger sample would be used. By understanding student presence and learning outcomes, we can develop better intervention plans for changing online relationships between students and instructors. With these new intervention programs, we could motivate students to participate in the online classroom and encourage better presence patterns.

ACKNOWLEDGEMENTS

This project is supported by the University Fellows Program of Ashford University.

REFERENCES